Sequential Determination of Polonium-210, Strontium-90, and Lead-210 in Environmental Matrices Using Sr*Spec™ Extraction Technology.

Yingdong Pan, Andrew Weitz, Doug J. VanCleef Environmental Science & Engineering, Inc., Gainesville, FL

A sequential determination of polonium-210, strontium 90, and lead-210 in environmental matrices has been developed and tested in matrices such as water, soil, and vegetation. The procedure involves the use of Sr*Spec™ extraction technology coupled with the use of the Induction Couple Plasma Spectrometer (ICP) for use in determining tracer recovery.

After the primary separation, polonium is spontaneously electrodeposited on a nickel disk and then analyzed by alpha spectrometry. Sr-90 is separated from Y-90 and other beta emitters and analyzed immediately for beta activity. The Lead 210 is separated from any of its daughter products and kept on the column for Bismuth ingrowth. The Lead-210 is then determined by its ingrowth daughter product, Bi-210 which represents the activity from its lead parent.

The chemical recoveries for strontium and lead are determined by the analysis of the stable tracers by ICP. The chemical recovery for polonium is determined with the use of a polonium-209 tracer.

Key Words: Polonium-210, Lead-210, Strontium-210, Sr*Spec™